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CONTENTS

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HOW LEADERS USE ORGANIZATIONAL LEADERSHIP EFFECTIVELY

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Abstract. *Leadership is the fundamental skill for any organization to grow and scale up in the long run. Employees are the asset for and to manage them, we need strong leadership team to guide and groom the human resources as per the organizational requirements. Leaders set small targets based on the bigger goal and their team uses those small targets to achieve the organizational goals. The objective of the article is to analyse the effectiveness of leadership in any organization and would study how leaders use organizational leadership to help companies achieve great heights. The purpose here is to highlight challenges an organization can face in the absence of organizational leadership and how a company might lose its aims and objectives under a poor leadership team.*

Keywords: *enterprise personnel strategic management, personnel competences, personnel competencies assessment methods, expert assessment, rank model.*

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Introduction

Organization leadership is a huge subject in modern human resources and that has been studied in the past few decades. Our hypothesis here is that leaders use organizational leadership effectively to achieve organizational goals. Leaders use their organizational skills to groom the resources and make them aligned with the company's goals and objectives. Human resource and their psychology at workplace has been an important part of an organization known to shape its growth path in the long run. Usually, expenditure incurred in managing the human resources has been considered under expenses section of the income statement and has been shown as a cost to the companies. But with time this has changed and now human resource are considered to be an asset in the organization. Leadership plays a pivotal role in the company's long term growth and development (Awadh, A.M. and Alyahya, M.S., 2013).

The growth of human resource management standards has led to a change in the traditional way of skills for management and companies are experimenting with different models of leading people. The value of human resource has been given more weight and HRA method has been used to add to the asset value of the companies and reducing losses due to expenses shown for human resource management. The international way of leading people methods have different across the world and a comprehensive study has been done in this paper to understand the approach adopted by the countries across the globe for human resource management. Organizational leadership would surely help in that (Friedman, A., Carmeli, A., & Dutton, J. E., 2018).

Literature Review

The evolution of people management skills by studying human psychology has brought a major change in the ways the skills for leading people have been done as shown in Figure 1. HRA measures are now being used in organizations for skills for reporting. Following the path of international standards, a more complex fair value approach is being studied by countries across the globe to change their method of leading people. Now the intangible assets are also considered for skills for leading people and reporting. The measurement of HRA for further analysis in leading people is now important and human resource measurement is an important part of this subject.

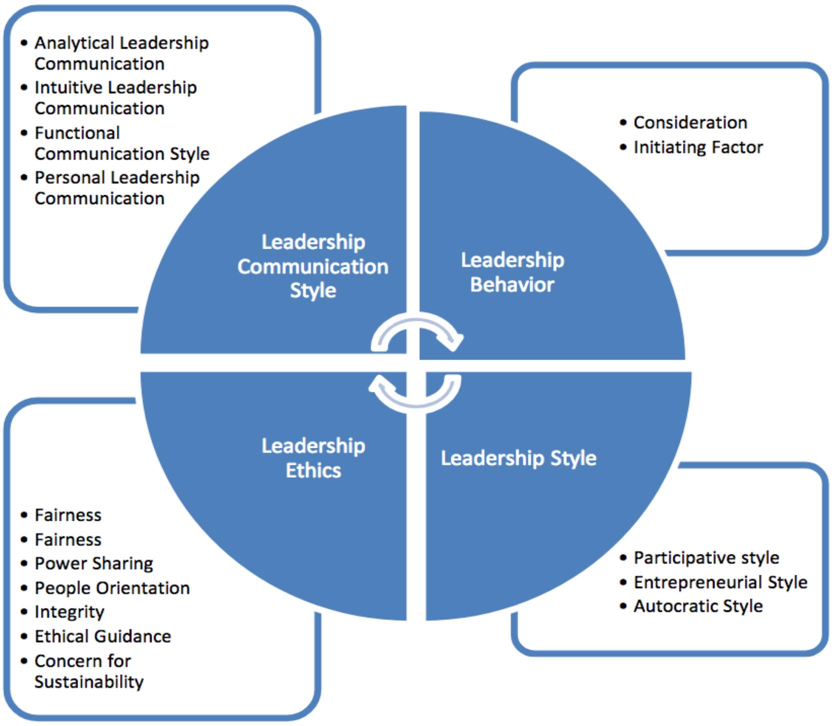

Figure 1. Effective Leadership

Source: https://ejbmr.org/index.php/ejbmr/article/view/13

The managerial reporting and decision making is also impacted by the human resource and any future growth and expansion plan of the companies is highly dependent on that. This makes the human resource an important long term asset for any organization and needs to be accounted accordingly. This will generate the insight of going for lesser layoffs and pay cuts in future and focusing on preserving the human resource. Human resources would no longer be considered as an expense or the loss making proposition for companies. Investment in human resource would come under investing in asset for companies. And hence organizational leadership is paramount for any company to succeed in the long run (Antonioni, D., & Park, H., 2001).

Leaders use organizational leadership skills to train and guide the resources, aiming at the company's goals and objectives. Human resource management and leading people and their measurement model is an important part of discussion in the paper. The cost of human resource consists of acquisition and learning cost. The acquisition cost would include expenses incurred while hiring and selection of resources and learning cost would include the expenses incurred while training the resources as per their roles and responsibilities for which they have been selected. But these costs would then be compared with the values, the human resource would generate in the short and long run. And the present value would be calculated by discounting the profits expected to be gained in the long run. The discounting factor could be chosen by considering the market standards (Baack, D.W., Harris, E.G. and Baack, D., 2012).

Human resource valuation models have been studied and it is an important part of this research where the future value of human resource is forecasted as per their current values. The expected future psychology is studied to the present value in that case to derive a final valuation for the human resource. It is pertinent to mention that without a strong leadership team, the human resources in an organization would lose their direction leading to slow growth of the company.

Leaders grow and with them their team and the company grows (Goby, V.P., Nickerson, C. and David, E., 2015).

Organizational leadership needs to be studied and experimented further in the human resource development science and this skill needs to be used in future to strategise the growth of companies better. It was found that the short and medium term strategy of the companies would include the improvement of services for increasing the customer satisfaction. The long term vision of the companies needs to be aligned with the medium and short term strategy opted for the companies (Bose, I., 2018).

Organizational aims and objectives would include the medium and short term objectives along with its long term vision. Alternative strategies used through medium and short term planning would further strengthen the long term vision of the companies and would gain the trust of shareholders in the long run. The companies aim to perform better and become bigger using alternative strategies as per the requirements. The organizational aims and objectives planning would allow the companies to clarify its vision and accordingly define its aims and objectives to choose the long, medium and short term strategy. Leadership is a huge subject which could help in unveiling the science of human resource management better (Carr, A., 2004).

Methods

Leaders use organizational leadership to help the organization grow in the desired direction. They lead the path to success in the long run. The advances in international method of leading people by understanding their psychology have resulted in the change of the traditional methods of leading people, especially for human resource management. The HRA method is being studied further to account for different human resource metrics as shown in Figure 2. The view of human resource management has changed completely over the period of time and now human resource is considered as an asset for the growth of the companies in the long run. The system approach has been used here to study the gaps in the leadership.

Figure 2. The Leadership Gap

Source: https://helpjuice.com/blog/corporate-leadership-training

The international skills for leading people standard has contributed a lot to this kind of change and now different countries are experimenting with their leading people models to see human resource from a fresh pair of eyes. The fair value of leading people has been popular following the GAAP of USA and that will make the use of HRA a potential option to consider the skills for leading people in future. The skills for development environment are changing and it will have further impact on the human resource measurement and will definitely change the outlook of psychological skills for reporting with that respect. The stability factor is something which is very important here in organizational leadership (George, D., & Mallery, P., 2003).

Leadership skills are the backbone of human resource management and organizational leadership makes this task of human resource management easy and sustainable. The literature available for the workplace culture is very helpful in determining its impact on the employees' performance. Employee performance is monitored all round the year with continuous improvement plans. Organizations use a year round evaluation of the team performance to find gaps and ensure the timely correction of those gaps to make sure that the team performance is aligned with the strategic objectives of the companies (Allyn & Bacon. Hall, Tracy and others, 2007).

Leaders work on grooming the human resources and use organizational leadership as a tool to help the company grow and scale. The quarterly monitoring of team performance allows the timely initiation of changes where necessary and helps the organization in staying on track in terms of its annual skills for planning. The team performance measure tool further organizes the process of measurement and helps the easy monitoring of the team performance. The initiation of changes well in time helps the companies in managing its planning and performance better in order to bring the companies on a continuous path of growth and expansion. Company's growth and expansion is a tale of leadership which can be confirmed in the research and experiments as well.

Organizational leadership skill has proven itself in the growth of not just the company, but also their employees in the long run. As per the researchers, team performance measurement is highly organized and based on the current performance and psychology of the team members and companies and set objectives of the future, the team performance measurement tool can forecast the sales target of all the teams in the organization. The value of the team performance to measure future team performance is analyzed to create a forecasting model for the organization in order to align the team performance with the strategic objectives of the companies. Future team performance along with the current team performance is well aligned with the companies' aims and objective with the performance measurement tools which helps in creating the performance forecasting models as well. The research revealed that the agreed objectives form the base of the team performance in organizations studying and utilising human psychology (Hameed, A., and Waheed, A., 2011).

Organizational leadership skills are being used by the leaders effectively as a tool to success of the company and their resources. Any problem in performance is analyzed and found in the quarterly performance assessment and the changes are suggested to account for the gaps in order to meet the strategic objectives of the organization. The team performance is very important in meeting the strategy of the organization. The companies keep a close track on the measurement of team performance and makes sure that the performance is monitored year round with continuous feedback and replanting wherever and whenever required.

The problematic performance is measured against the set targets and based on the gaps changes are suggested and the mentoring is done throughout to ensure the closing of the gaps. We can build the financial assets of the company again but human resource development is even more crucial than that and needs a significant amount of time to develop and nurture. Leaders use organizational skills effectively to build the human resource asset of the company and nurture it using the same tool in the long run (Haque, M.F., Islam, and Md, .Haque, M.A., 2014).

Results

Organizational leadership is the key to success for any company in the long run. The well established fact is that the human resources are the asset for any company and hence their management is very crucial. The sustainability factor is an important piece while studying the human resource psychology. The research made in this area confirms that for companies to sustain in the long run, it is very important to value its human resource. The human resource management becomes more important with the growth of the companies and the human resource needs to be considered as the asset for the skills for leading people (Forest, J., Mageau, G. A., Sarrazin, C., & Morin, E. M., 2011).

Global standards have been picking up slowly to accommodate this in their part of future research and modelling to study the impact of human resource on skills for leading people and companies' valuations. The valuation of companies would increase if human resource is put under the asset category in the organization instead of being kept as the expenses in the income statement.

Organizational leadership has been experimented on multiple human resources and their growth has been tracked to measure the effectiveness of this skill (Gunaraja, T.M., 2014).

International companies have taken this human resource management and its implications very seriously and are studying different models to accommodate the HRA and work towards making their valuation model more accurate as shown in Figure 3. In order to capture the full value of an organization, human resource cannot be ignored and needs to be accounted clearly in the valuation of companies. The need is to change the mindset to change the management policy and prioritise the human resources considering their value as an asset to the companies instead of just being considered as a cost to the companies (Jabeen, F. and Isakovic, A.A., 2018).

Figure 3. How to improve leadership performance and effectiveness
Source: https://www.ckju.net/en/dossier/leadership-performance-and-effectiveness-what-it-how-it-works-and-how-improve-it

Led by USA, other countries like India, China, Greece, Europe, UK, Australia and Canada has been researching on human resource management models using human psychology. They are trying to understand the long term benefits of changing their traditional leading people method by including human resource in their organization. The HRA metrics would increase the valuation of their companies and would take them towards sustainability in the long run. Human psychology is one of the most important aspects of human resource management in any organization. To get the work done and to increase productivity along with the efficiency of employees, it is very important for the employees to be motivated. And to keep them motivated it is very important to understand their expectations from the organization. To influence them, it would be crucial to understand their thought process, and understanding their psychology would help in understanding their thought process (Jabnoun, N. and Sedrani, K., 2005).

Moreover, not all employees are similar and everyone has expertise in a different field which needs to be found out before the allocation of work. Targeting the right potential for each task is very important to keep the efficiency of the workplace higher. And for that again understanding human psychology would help as it would help the management in figuring out the strong area of expertise for each employee. Organizational leadership is one of the most key factors to success of any organization in the long run. It has been proven every now and then in multiple research and experiments (Fu, W. and Deshpande, S.P., 2014).

Discussion

The research says that the leaders use organizational leadership effectively to train the human resources in the right direction. The strategic objective of organizations is to establish itself as one of the people loving units. The companies aim to align its resources to maximize the customer experience and provide value added services. The business model focuses on acquiring more and more customers and market share in the retail industry to maximize its profit based on volume of sales. Human resource, being the key asset of a company needs a lot of attention and strategic management to help the company prosper in the right direction.

To align with this strategic objective, companies have set team performance objectives. The team performance is measured against the volume of sales generated by the companies. The team performance and incentives are linked with that and accordingly the appraisal is decided for the team and for the individuals. The companies have linked all its team performance metrics. Organizational leadership is sometimes ignored and not taken seriously and human resource attrition rate is high in that case making the pace of growth slower for a company. Further, it was found that the current performance in organizations is measured against the set targets based on the companies' goals and objectives (Halepota, 2005).

The performance target within teams are then easily defined based on the gaps in the current performance and that helps the companies in aligning its targets year round to match its strategic objectives. The companies ensure that the performance targets within teams and even individual performance targets are spread across the year to avoid any load and pressure at one time. This way of setting targets and performance measurements helps the companies in balancing the targets along with the work life balance of its employees. The performance target within teams is compared with the current performance while setting the targets to make sure there is not a huge difference. Leaders use their leadership management skills and organizational leadership tool as a use case to groom and train the human resources. Researchers revealed that team performance plans are decided based on the strategic objectives set for the companies (Klijn, M., & Tomic, W., 2010).

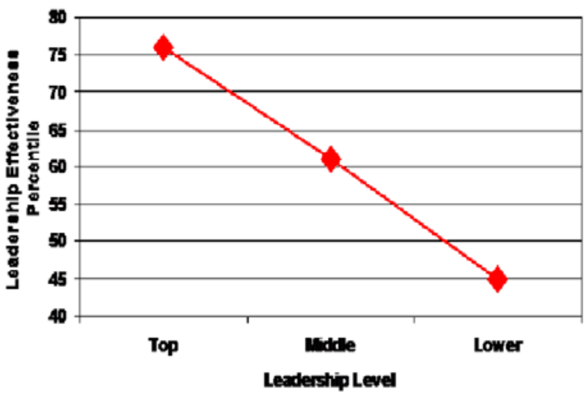

Figure 4. Leadership Effectiveness by level

Source: https://zengerfolkman.wordpress.com/2010/09/15/the-leadership-ceiling-how-leaders-can-build-up-or-bring-down-an-organization/

As we go up in the hierarchy the leadership effectiveness increases as shown in Figure 4. Organizational leadership skills need to be considered effectively and human resource management is mainly dependent on that. The plan is created using the organizational leadership tool. The plan is then evaluated and checked for its practicality. The team performance plan is then validated with the current performance of the team to see if there are huge gaps which needs to be taken care of and addressed. The team performance plan and strategic objective is analyzed to see if any change is required in the team planning and team structure to achieve the aim of fulfilling the strategic objective of the organization.

Leaders are born not created and leadership tools make the management better. Team performance planning forms an important part of annual planning for any organization and this is evaluated on a quarterly basis to ensure the alignment with the strategic objective of the companies. The Study found that the organizational strategy aims at aligning the companies' aims and objectives to the plan of growth and expansion. The companies have seen a phenomenal growth in its sales over the past few years and the future scope of development looks brighter. The companies aim to spread across the globe and establish itself as a leading retail chain.

The existing organization strategy takes care of this aim and objective of the companies, thus helping in creating a strong vision for the companies and its long term growth and expansion plans. The evaluation would remain positive for the companies' organizational strategy as it is in line with the companies' aims and objectives. Organizational leadership helps in achieving the set targets. Moreover, it was seen that the existing strategy of organizations is supportive in the achievement of organizations aims and objectives. The existing strategy of monitoring the companies regularly for its key metrics performances and modify or suggest changes when ever required is a good plan to keep the companies' performance on track.

The annual planning of the companies' aims and objectives gives a baseline to define the organizational strategies to help the achievement of set standards declared by the companies. The organization has been clear in its vision and with that in mind the strategy is decided. The existing strategy is checked for its performance and practicality on a regular basis and any change suggested is implemented to keep the companies' performance on track. As per the research, based on human psychology, companies set team performance targets based on the companies' current performance and the future objectives set for the companies' next skills for year. Effective use of organizational leadership will help in achieving the better human resource management in an organization. The sales target is fed into the enterprise system which is monitored every quarter in the organization (Sharma, G., 2017).

Teams and individuals are assigned their respective sales target based on the organization level sales target set in the objective of the companies. The enterprise system updates the gaps in the target set and achieved to notify the differences to the team leads so that they can align their performance well in time. A continuous measurement of team performance happens all round the year to take care of the strategic objectives of the companies and this technique helps the organization in achieving the set targets. Further, it was found that Individual commitment is an important part in the success of any organization. Leaders use different tools to manage human resources and then achieve the set targets of the company.

Organizational leadership skill is popular now in all the developing and developed companies. The employees are awarded based on their individual team performances and are evaluated on the basis of their individual performance along with the team performance. This technique of measurement inculcates the sense of belongingness in the employees and they feel the need of working hard to take themselves and the organization forward. The companies measure the individual commitment along with the team performance to align the companies' performance with its strategic objectives. This helps in planning the long term growth of the organization and gaining the trust of the stakeholders with the good practices in the organization. Effective leadership skills are the key to success of human resource management (Ahmad, A. and Salam, S., 2015).

Conclusion

Effective organizational leadership is the way to success for any organization and leaders use that tool in the long run. Further, it was seen that the aims and objectives of the organization are clearly aligned with the companies' strategic objectives. The companies have designed its aims and objectives accordingly to fulfil its goals and the performance targets are said accordingly for the teams. The human resource has been trained based on the present strategy to achieve the target set for the organization as per its long term vision organizational strategy aims at aligning the companies' aims and objectives to the plan of growth and expansion.

The companies have seen a phenomenal growth in its sales over the past few years and the future scope of development looks brighter. The companies aim to spread across the globe and establish itself as a leading retail chain. The companies have designed its aims and objectives accordingly to fulfil its goals and the performance targets are said accordingly for the teams. As per the literature available, the organizational goal is simple and includes the long term vision of becoming a powerful leader in the retail industry. The companies have designed its aims and objectives accordingly to fulfil its goals and the performance targets are said accordingly for the teams (Ho, V. T., Kong, D. T. Lee, C-H., Dubreuild, P., & Foreste, J., 2018).

The human resource has been trained based on the present strategy to achieve the target set for the organization as per its long term vision. The sense of belongingness is admirable and the companies ensure to take care of all its employees. It would be entirely true to say that the present strategy is sufficient to achieve the organizational goals. The human resource has been trained based on the present strategy to achieve the target set for the organization as per its long term vision. As per the research, the potential problem lies in the wide competition existing in the market. The companies have established itself as a huge brand but the competitors are equally strong and have good presence.

Research says that the potential strategic problems are taken care by the right strategy of the companies by establishing itself as a different brand for the customers. Further, the competition in the market makes this problem even more difficult by increasing the attrition rate of the customers. The companies could not simply give lucrative offers to the customers to retain them as the companies also has to look into the profit the organization is expecting and the shareholders' interest as well. The strategy defined by the companies to cater the competition in the market is strong enough to cater the potential problems arising out of it.

The further study could cover these factors and determine how much impact the culture is making alone. The strategic option has caught the interest of stakeholders by defining a clear path of growth for the long run. The companies' current strategy is to win the customers' trust and provide a quality service to increase the volume of sales. The strategic objective of the companies is in line with its aims and objective and that all sums up to the growth of companies by gaining more customers across the globe. The organization has been clear in its vision and with that in mind the strategy is decided. The existing strategy is checked for its performance and practicality on a regular basis and any change suggested is implemented to keep the companies' performance in check.

The different horizons explored with this methodology have helped the stakeholders in working better for the companies by realizing its true potential. The companies aim and objectives are also analyzed to check if the strategic options adopted by the companies are in line with its long term vision. The companies ensure that the monitoring exercise suggests the modifications in the strategy of required maintaining the interests of the companies' overall along with its stakeholders. The planning done by the organization is at all the levels. The companies believe that for a stable growth and development of the organization, the study of human psychology is important and hence should be studied in detail. However, the impact of the culture on employee performance is not solely dependent on this and there are many other factors influencing this. Organizational leadership is the way in future to manage human resource assets of the company (Tsarenko, Y., Leo, C., & Herman, H. M. T., 2018).

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JEL Classification: C39

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TECHNO-ECONOMIC ASSESSMENT OF IMPLEMENTING THE PROTECTION OF SOLAR BATTERIES IN SPACECRAFT POWER SYSTEMS

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Abstract. *Sustainable development of the space activity will only be made possible once space users will be implementing technologies and practices that are capable of ensuring the use of energy efficient technologies. The presented study employs a method of creating a fuzzy cognitive map of protection of solar batteries in spacecraft power systems. A cognitive model has been developed for the purpose of determining the level of protection of solar batteries in spacecraft power systems. The paper contains an elaborated scenario which reflects the system's response under complex maximum mitigation of influence from the most substantial concepts. As a conclusion, practical implementation of the method enables to anticipate the degree of protection of solar batteries in spacecraft power systems and contributes to the implementation of the required mechanisms of prevention, protection and access control on corresponding levels of energy infrastructure.*

Keywords: *solar battery, spacecraft, cognitive modelling, energy efficient technology, payback period.*

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Introduction

A possible area for the use of solar energy in the 21st century consists in the creating orbital power plants with solar batteries which accumulate the solar energy and convert it into microwave or laser emission directed towards the Earth where it is collected by special antennas and eventually transformed into the electric energy.

One of the efficient sources of energy in the space activity is the use of solar energy. In space, with no atmosphere, clouds and day-night change cycles, ten times more solar energy is projected per unit area than reaches the Earth's surface. However, extreme factors of solar batteries operation in space formulate the necessity for thorough substantiation of parameters for their selection.

An important issue in the development of solar energy is the high cost of energy. Improvement of the reliability, durability and safety of solar cells are the main ways to reduce the cost of energy. A significant, still unsolved problem is the failure of individual solar cells in the solar systems for generating power. Up to 30% of damage occurs due to the presence of individual defective solar cells (Nakashidze et. al., 2020). This leads to a significant reduction in the generating capacity of the entire power generation system, or until its complete failure. In order to solve this problem, it is possible to use switching elements with a positive temperature coefficient of resistance, in particular, thin films based on polymer nanocomposites with wire fillers, which are capable of blocking damaged solar cells.

This puts into the foreground a scientific search in the domain of development of energy efficient technologies, determination of electrothermal protection of solar batteries in spacecraft power systems, reduction of failures, etc.

The purpose of the present paper is to substantiate the improved methodology of techno-economic assessment of implementing the protection of solar batteries in spacecraft power systems.

According to the specified purpose of the paper the following tasks must be resolved: to conduct an analysis of technical and economic indicators that impact the performance efficiency of solar batteries in spacecraft power systems; to develop a cognitive model for determining the degree of impact of threats on the level of protection of solar batteries in spacecraft power systems; to study the structural properties of the elaborated cognitive model; to conduct a scenario modeling for the purpose of defining a relative change in the level of protection of solar batteries in spacecraft power systems.

Literature Review

The formation of a strategy for the development of industrial enterprises on the basis of energy saving is a process that allows studying the possible behavior of energy suppliers in order to choose the most acceptable energy supply option for a certain period of time (Bowen, 2018).

The real possibility of choosing suppliers of energy products, taking into account the need for them to ensure an adequate level of reliability of energy supply in the case of the lowest costs is associated with the formation of a competitive market in the energy sector and with the possibility of buying electricity in the wholesale market (Prunariu & Tulbure, 2017).

The development strategy of industrial enterprises on the basis of energy conservation, which is functional in nature, should be aimed primarily at the imp lementation of a general strategy for the development of an industrial enterprise, at the same time taking into account the state of the internal environment and its possible dynamics (Brady, 2017).

That is why in the case of forming a development strategy for industrial enterprises on the basis of energy conservation, the limitations imposed by the adopted general development strategy of an enterprise on the number of personnel of energy services, the amount of material resources allocated to them and investments to maintain the necessary proportions in the development of the energy sector and core production should be taken into account (Quintana, 2017).

The wide interdependence of individual power plants, the use of fuel and energy resources and the use of technological processes in manufacturing implies an objective need to optimize decisions made in the process of shaping the development strategy of industrial enterprises based on energy saving, taking into account the impact they will ha ve on the economic performance of the enterprise and product competitiveness (Muelhaupt et. al., 2019).

Despite a growing number of current studies within the presented scope, there still remains little to no research effort conducted on the issue of improving the methodology of the techno-economic assessment of implementing the protection of solar batteries in spacecraft power systems. This primarily concerns the issue of determining the implementation of methodology which will enable to trace the interrelation of impact of corresponding technical and economic indicators.

An issue of evaluation of a cumulative impact of threats upon the system and the possibility to determine risks under different scenarios of realization of multiple threats remains vital for conducting an assessment of implementing the protection of solar batteries in spacecraft power systems.

A solution to this issue is possible by means of resorting to the methods of statistical analysis, among others the correlation and regression analysis. However, these methods require complex calculations, significant scope of experimental data, long period of time for processing it and does not ensure the possibility to work with quality factors that are being expertly defined (Pekkanen, 2019). In this regard it is worth drawing attention to the cognitive approach based on creating fuzzy cognitive maps (FCM).

A priority in selecting FCM relates to their simplicity, constructiveness and clearness in visualization; identification of cause-and-effect relations between the elements of a complex system which are otherwise complicated to conduct a qualitative analysis upon by traditional methods; use of knowledge and experience by the experts in the subject area, adaptability to uncertainties in the source data and requirements of the researched problem (Chow, 2020). Furthermore, it is well worth noting the simplicity of expanding the factors by means of introducing additional vertices and arcs to the graph of the cognitive map.

These problems may be solved with the help of the methods of cognitive modeling (Drobyazko et. al., 2021). Cognitive models are developed by an expert or a group of experts in the researched subject area on the basis of the theoretical, statistical and expert information related to the object of research. The adequacy of the model is determined by the comprehensiveness of the body of initial knowledge; the model can be adjusted and refined in the process of research and employment being in itself a source of structured knowledge (Czerny et. al., 2018).

Methods of cognitive modeling are based on the use of FCMs with their inherent relative ease of interpretation, integration with the methods of assessing the results of the analysis, clearness, flexibility, constructiveness, adaptability to uncertainties in the source data, absence of need for preliminary specification of data and reciprocal influence relations (Weinzierl, 2018).

FCM of a complex system (problem) constitutes a directed graph with its vertices (concepts) representing system variables and its arcs – cause-and-effect relations between concepts, moreover the weights of such relations determine the degree of influence of concepts upon one another (Maclay & Mcknight, 2020).

A cognitive map is a model of representation of experts' knowledge on the laws of development and properties of the studied situation while their multiplicity is determined through various types of expert definition of the strength of cause-and-effect relations and significance of factors on the cognitive map.

Results

To develop an FCM which identifies the safety status of protection of solar batteries in spacecraft power systems it is of prime importance to form a set of concepts that prove to be the most substantial from the standpoint of studying the presented problem. Resulting from the survey and the harmonization of views by experts in the given subject area the following concepts have been identified.

C1. Cost of delayed decisions. Potential savings equal the same potential costs if the company does not implement corresponding systems of technical protection of solar batteries.

C2. Maintenance accessibility in emergency situations. Emergency situations in the process solar batteries operation in the conditions of space include: failure of battery opening, fire, space weather, solar cycles, etc. Impossibility to conduct repairs of solar batteries, particularly solar arrays of the truss structure of the ISS, renders spacecrafts fully or partially unpowered.

C3. Service life of solar batteries. Whereas solar batteries on the Earth have a service life of 3-5 years, in the conditions of space a service life of monocrystalline solar batteries is extended to 20 years. Taking into consideration the economic aspect, it is necessary to account for the given payback period in the calculated changes in cost in the operation and maintenance (O&M) (Hilorme & Horbach, 2021).

C4. Cost of solar batteries. Production costs may be defined through adding up the manufacturing costs (costs for development, testing and assembly), costs of operation and maintenance (O&M).

C5. Operational reliability. Operational reliability is manifested in technical characteristics of photovoltaic modules: electrical, mechanical and thermal properties of the model. Operational reliability has a direct impact on the conversion efficiency of solar batteries.

C6. Weight and dimensional parameters. Ensuring a substantial reduction in weight and dimensional characteristics. Due to the use of reusable launch vehicles to transport solar batteries into the orbit, there emerges an issue of the existing maximum value of useful payload of a spacecraft. It is therefore the use of energy efficient technical means of electro-thermal protection is based on their functional capacity to ensure significant reductio in weight and dimensional paraments of solar batteries and their reusability. For instance, the usage of the polymeric posistor nanocomposites of the PolySwitch technology.

C7. The given payback period in the changes in cost in the operation and maintenance (O&M). New equipment may require more or less O&M works. It should be noted that costs that are accounted for in the calculation of this indicator have the following components: the cost of solar batteries, the cost of delivery into orbit and O&M costs (Dron' et. al., 2022). Each cost component is attributed to different contractors.

Having formulated the list of concepts, it is essential to determine the value of the force of reciprocal influence between each pair of concepts by means of processing the data obtained through the expert survey. For this purpose, the authors propose to specify a fuzzy linguistic scale that represents an ordered set of linguistic values (terms) for assessment of occurrence of possible consequences obtained as a result of influence of one of the concepts on another. Each of these values will be assigned a corresponding specific numeric range which belongs to the interval [0;1] for positive feedback and the interval [-1;0] for negative feedback (Table 1).

Table 1
Linguistic scale for assessing possible consequences of reciprocal influence of concepts

Range of values	Linguistic terms (feedback)
(0.85;1]	positive very strong
(0.6;0.85]	positive strong
(0.35;0.6]	positive medium
(0.15;0.35]	positive weak
(0;0.15]	positive very weak
0	no influence
(0;-0.15]	negative very weak
(-0.15;-0.35]	negative weak
(-0.35;-0.6]	negative medium
(-0.6;-0.85]	negative strong
(-0.85;-1]	negative very strong

Source: author's development

An FCM that illustrates multiple cause-and-effect relations and the pattern of interaction between the identified factors is represented in the Figure 1.

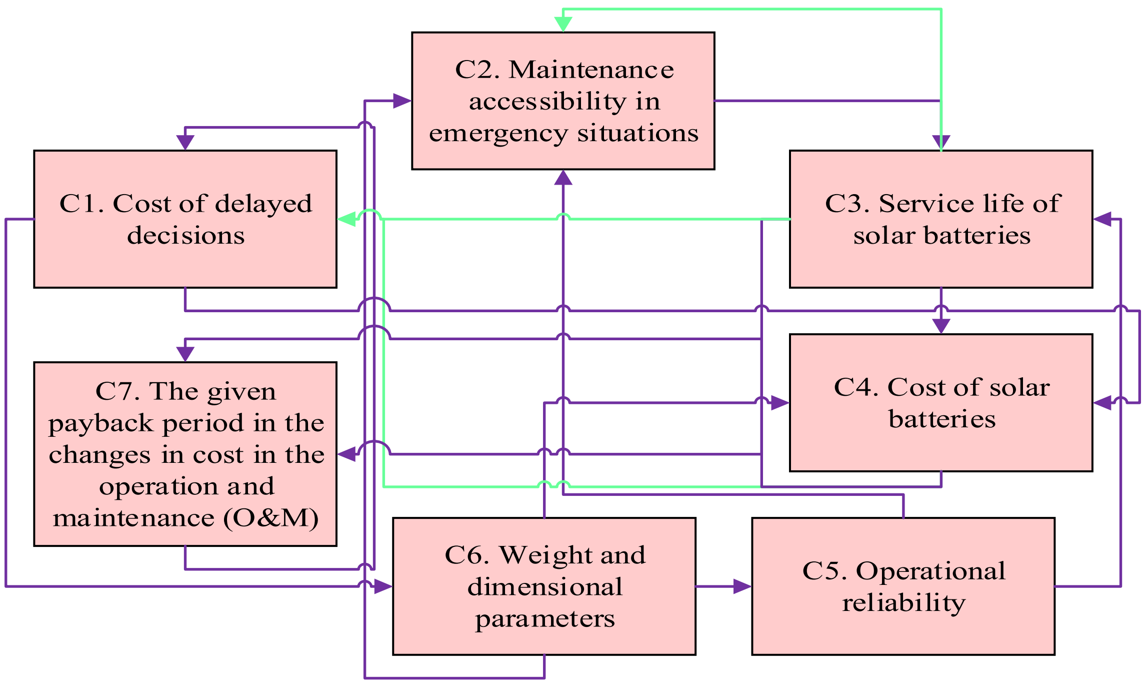

Figure 1. Fuzzy cognitive map of interaction between the identified factors
Source: author's development

To determine the complexity of the developed FCM a calculation of the density of links will be conducted. The number of concepts according to the model – 7, the number of links – 15, the density of links is 0.08. This indicates a sufficient complexity of the developed cognitive model.

To conduct an analysis of FCM it is imperative to take into consideration an entire scope of indirect reciprocal influence of concepts. For this purpose, an adjacency matrix is elaborated on the basis of the previously developed cognitive map (Table 2).

Table 2
Adjacency matrix of the fuzzy cognitive map

Concept	C1	C2	C3	C4	C5	C6	C7
C1	0	0	-0.38	-0.15	0	0	+0.85
C2	0	0	-0.55	0	+0.86	+0.22	0
C3	0	+0.92	0	0	+0.88	0	0
C4	+0.75	0	+0.94	0	0	+0.64	0
C5	+0.18	0	0	0	0	0	0
C6	0	0	0	0	0	0	0
C7	0	0	+0.92	+0.95	0	0	0

Source: author's development

Having analyzed the values of the presented indicators it is possible to determine the most significant concepts of the examined system: C5 – operational reliability; C4 – cost of solar batteries; C3 – service life; C7 – the given payback period in the changes in cost in the operation and maintenance (O&M). It is furthermore expedient to note that lowest influence on the operation of the grid is demonstrated by the concept under C6 - weight and dimensional parameters.

To obtain forecasts related to the development of the situation a relative change of system's concepts with the maximum value of influence of the most significant concepts must be determined факторів (Drobyazko & Hilorme, 2021). To specify, corresponding scenarios will be modelled. As an instance, a Scenario «How will the state of the system change under the maximum increase in the value of the concept C3 «Service life of solar batteries» will be examined. The calculations will be conducted on the basis of the data in Table 2.

As a consequence of maximum increase in the value of influence of the service life of solar batteries the cost of delayed decision is reduced by 0,02, the maintenance accessibility in emergency situations - by 0,05, operational reliability is increased by 0.06 while the cost of solar batteries is increased by 0,04 (Figure 2).

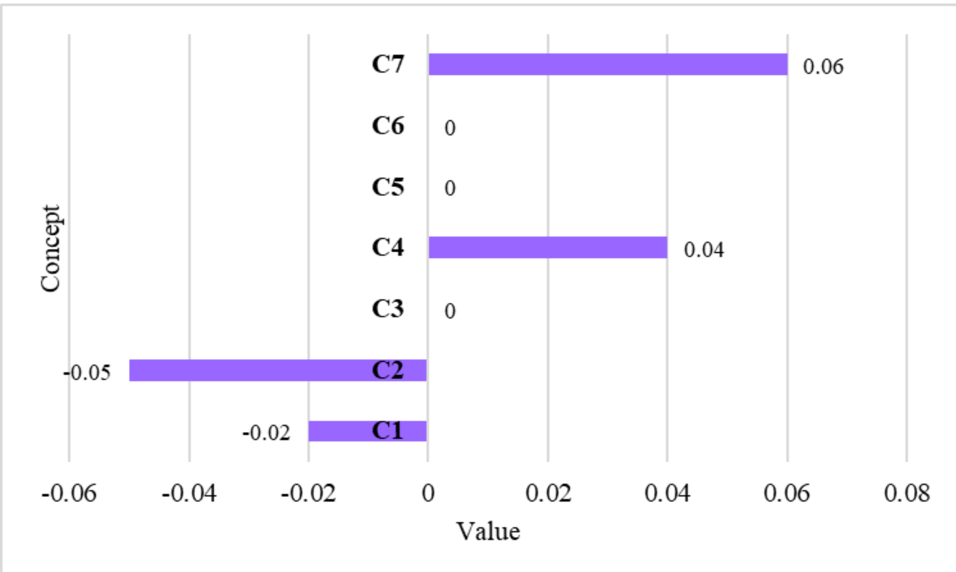

Figure 2. Scenario depicting the reaction of the system to maximum increase in the value of influence of the concept C3 «Service life»

Source: author's development

According to calculations (Figure 2) the most substantial influence under the maximum increase in the value of concept C3 «Service life» is exerted upon the concept C7 «The given payback period in the changes in cost in the operation and maintenance (O&M)».

Profitability indicators cannot be determined without considering supplementary conditions: qualifications of operation and maintenance personnel, operational conditions of energy-intensive equipment, etc. (Hilorme, 2020). The rate, at which energy savings would allow initial capital investments (investments into energy efficiency) to be recouped, must become the primary factor for assessment of the energy modernization as compared to other types of investment. Concurrently, the estimation of the period of delay in the management decision making must be economically justified – how long the actual delay persists (from the concept to making a decision). The management must understand the problem of the «energy efficiency potential» and the cost of delayed decisions.

Discussion

An effective investment project in energy saving should be evaluated, created, selected from a number of possible before it starts to be implemented. As for most difficult controversial issues, it is impossible to immediately select the most optimal investment project, if you do not realize the potentially available opportunities for their risks, requirements and benefits. For a more detailed picture of energy consumption, which will allow to evaluate energy saving projects that are planned to be implemented at industrial enterprises, it is worthwhile to introduce energy management.

In order to determine the effectiveness of an investment project in energy saving, it is necessary to define evaluation criteria. We propose to determine the three components of the coordinate system of the management decision-making plan for an energy saving project: x-value (combination of consumer and business), y-technical capability, z- degree of risk, they in turn have several levels of subcriteria. Thus, value is a compositional characteristic that is a synergy of customer value and business value. Thus, the subcriteria of value are four main characteristics: Cost; Lifetime performance; Security; Reliability.

Quantitative values can be determined by calculating the weighted average distortion coefficient along the axes of the coordinate plane. Thus, the project on energy saving and creation of protection of solar cells against overloads based on polymer nanocomposites has the following investment characteristics: high consumer value, high technical capabilities and medium risk.

We consider the dominant hierarchy of criteria for investment projects on energy saving for industrial enterprises built from the top (from a management point of view) through intermediate levels (criteria on which subsequent levels depend) to the lowest level, which is usually a list of alternatives. The hierarchy is considered complete if each element of a given level functions as a criterion for all elements of a level, stands below. We apply the hierarchy analysis method to determine the strategy of transition to an alternative type of energy carrier.

In order to implement the strategy for the development of industrial enterprises on the basis of energy saving, we are guided by the following criteria: cost; lifetime performance; security; reliability.

In our case, the maximum, taking into account all the criteria, is the estimate of the first alternative-solar energy, which has the highest priority value. On the other hand, the solution of this problem gives us the opportunity to allocate the available resources among alternative options according to their priorities. The next priority is the alternative-the use of biofuel, then-the use of secondary energy resources and in the fourth position-the use of wind energy.

As for the other criteria for the efficiency of an investment project on energy saving-the degree of risk and technical capabilities – we can also highlight the corresponding sub- criteria. Thus, the criterion “degree of risk” has the following hierarchies of criteria of the third order: incompleteness (fuzzy license for the production and sale of energy from alternative energy sources, lack of standards, premature offer from the supplier, fuzzy payment model for use); loss of control (lack of leadership, inconsistency of corporate policy); legal and regulatory issues (compliance with regulatory documents); security issues (data protection, lack of energy audit). The criterion "technical capability" – ease of integration, ease of migration, technological stack and the like.

Conclusion

The paper incorporates a developed cognitive model for the purpose of determining the level of protection of solar batteries in spacecraft power systems. A proposed model allows to define the most substantial threats from the standpoint of studying the presented problem and to analyze a relative change in the level of protection of the studied systems. A structural and topological analysis of the developed fuzzy cognitive map is being undertaken with its results attesting to its sufficient density, complexity and democratic mapping. The paper goes on to define the concepts that posses the highest structural significance, while simultaneously a scenario modeling is conducted within the scope of the paper, resulting in the identification of the change in the indicator of service life under maximum positive influence of such concepts.

The findings of the presented research enable to forecast the operational behavior of solar batteries in spacecraft power systems which, in its turn, contributes to the implementation of required mechanisms of prevention, protection and access control on the corresponding levels of energy infrastructure.

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JEL Classification: M11, M21

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COMPETENCY APPROACH IN THE STRATEGIC MANAGEMENT OF THE CORPORATE PERSONNEL

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Abstract. *Organizational and component elements of using the competency approach in forming stable personnel of the company are defined in the article. A methodological approach to the implementation of competencies in the strategic personnel management model was formed, and the modeling of strategic personnel competencies was carried out. The mechanism of application of the economic-mathematical model of the formation of personnel competencies in the corporation is developed and substantiated.*

Keywords: *corporate personnel, strategic human competence, competency approach, strategic management tool, HR specialist, principles of personnel management.*

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Introduction

Strategic changes in the economic and political system, as well as transformational changes in the country, present both great opportunities and serious threats for each corporation due to the increased degree of uncertainty and the presence of risks. This situation requires a more thorough substantiation of economic decisions on the priority of development of a certain type of corporation's resources, among which the personnel is a core component that provides flexibility and adaptability of the corporation's functioning in the conditions of socio-economic turbulence of both external and internal environment. The efficiency of production, which affects the volume and growth rate of products, the use of material and technical means, innovative development, and the like, depends generally on the professional competency of employees. In such circumstances, the competency-based approach to strategic HR management is of particular importance because it allows summarizing a wide range of issues of employee adaptation to external conditions.

Literature Review

In the area of studying innovative approaches to strategic human resource management, the works of renowned world-class economists are dedicated (Dessler, 2003; Yukl, 2002). In their works (Dainty, 2008; Greenberg & Baron, 2008), they define the concept of strategic personnel management as the system of methods and organizational-practical approaches to the formation of the mechanism of its implementation in specific conditions of work of organizations.

A particular attention should be paid to the work (Bucker and Poutsma, 2010) on the theoretical analysis of the competencies of the corporation's personnel, which requires constant implementation and development due to changing development priorities of the society, the transition to the higher degree of the technological way of the country's economy, and the like. The scientists (Kersiene & Savaneviciene, 2005) offer, in the context of competency-building technology, ways to create a competency system, highlight the advantages and disadvantages of the personnel assessment based on the competency model. Theoretical aspects for the formation of the concept of use of the competency approach in strategic personnel management are described in the works (Stor, 2012; Wright et al.), which substantiate the place and role of the competency model in the personnel management system, and also determine the constituent elements of the concept of the competency approach. However, the issue of substantiating the modern paradigm of a competency approach to HR management requires more in-depth research.

Methods

Methodological bases of research are formed on a number of positions: 1) strategic personnel management is one of the core business processes of the corporation, it is logical that the success of the corporation's activity is largely determined by the effectiveness of solving the whole complex of problems related to search, selection, hiring, training, evaluation, and stimulation of employees; 2) the use of comprehensive and objective assessment of personnel is an active and effective strategic management tool that allows solving personnel problems in organizations, achieving success in the competitive struggle and sustainability in the market due to efficient and rational use of labor resources; 3) model dialectics is determined precisely by the model of strategic personnel management, which allows creating a unified system of scientific and methodological tools and procedures for assessing the requirements that determine the priority of applying the competency approach.

Results

Competency approach in strategic HR management

New approaches in modern HR management that are used by leading EU and world countries in the field of strategic management are primarily based on competency-based scientific approaches. The authors analyzed each of the approaches and determined their effectiveness and suitability for use in the practice of modern corporations.

In the process of HR management, HR specialists or auditors define a system of parameters, which integrates all the necessary competencies that employees must have in accordance with job descriptions, and obtain the results of assessing the current state of the human resources management system. This allows identifying the level of each component of the set of employee's competencies. Research based on this approach should be founded on the need to understand that professional competencies are dynamic because a person is constantly in the stage of development of knowledge, capabilities, and skills. Thus, it can be considered that the development of competencies is a certain process that aims to enhance the effectiveness of the corporation as a whole by improving the level of professional competencies of employees. It is also one of the main tasks of the corporate personnel management system.

Obviously, the difference between the competency approach in strategic personnel management is the reorientation of personnel management objectives from the solution of operational HR problems to higher strategic tasks that go beyond the ordinary responsibility of the personnel management service. It is not enough to simply increase knowledge, improve the skills, competencies, and behavior of employees. This should result in increased labor productivity and organizational change that can increase the competitiveness and efficiency of the corporation activity as a whole. Therefore, the goals of personnel management in the context of a competency approach are formulated to show that these processes can improve the performance of the corporation by achieving higher performance, changing employee behavior, and increasing productivity and efficiency of the corporation (Ogrean et al. 2009). In essence, this entails a new concept of personnel management, which focuses not on the process or operational results of the work but on the mechanisms and models of management based on the competency approach and their impact on the long-term effectiveness of the company.

The task of the personnel management system based on the competency approach is to create an environment that supports and guides personnel self-development. The concept of competency approach is an integrated concept that forms the basic principles of personnel management of a modern corporation (Sutton & Watson, 2013). Such principles include:

1. Systematicity principle - the use of the competency approach in personnel management should be based on a coherent whole: goals, objectives, and processes of personnel management and be oriented to the short- and long-term goals of the corporation.

2. Integrity principle - the development of tactical and strategic decisions in the area of competency approach should be realized taking into account the interrelationships between different areas and aspects of personnel management.

3. Relevance principle - activities in the field of use of the competency approach in personnel management should be appropriate to the personnel situation, offer solutions to current personnel problems of the organization based on the best experience and modern scientific developments.

4. Continuity principle - activities in the field of the use of the competency-based approach in personnel management should focus on the ongoing training and development of employees to improve job performance, build a potential for growth and development throughout corporation life.

5. Succession principle - dominant values, unique knowledge, skills, and experience acquired by employees in an organization should be disseminated within it to improve work performance, retain and enhance its competitive advantages.

6. Advanced development principle - the expansion of the professional horizons and competencies of employees to create a stock of knowledge and skills that may be needed when solving complex problems or non-standard tasks of the corporation in the future.

7. Self-development principle – the creation of conditions for self-training and self-expression of employees to activate internal mechanisms of development, providing growth of motivation for effective work, increase of job satisfaction, more complete disclosure of professional and personal potential.

8. Efficiency principle - the results of activities in the use of the competency approach in personnel management should provide the necessary level of achievement of economic, organizational, and social effects, thereby contributing to the increase of efficiency of the organization (Draganidis & Mentzas, 2006).

Modern corporations are increasingly using the ideology of the competency-based approach to all areas of personnel management. Therewith, the competency model is a central element of the personnel management system, around which specific functional directions of personnel management are concentrated: personnel selection, motivation, adaptation, training, development, and evaluation.

For the corporations, those components of integrated indicators are important that, according to the expert assessment of the social situation, allow developing of "quality of life" ("quality of working life") and "enrichment of labor" models, while managers direct their forces to increase "quality of working life", emphasize attention to improve the workforce, improve the skills of employees, reduce professional stress, and develop relationships between employees and managers (Barman, 2011).

Modeling of strategic personnel competencies

On the basis of the results of the dialectical analysis of scientific-analytical information sources, the most optimal general competencies that the corporation personnel should acquire were selected (Table 1).

Table 1
Optimal set of general competencies of corporate personnel in the concept of strategic management

Competencies	Description
Teamwork ability	Teamwork shows the respect of colleagues and employees Develops and maintains good working relationships with others, sharing information and knowledge Formation of own proposals, ideas, and perspectives Understanding its role in the team, making every effort to qualitatively play its part
Processing of large arrays of information data	Ability to extract essential conclusions from information sources Work with different types of information such as numeric arrays, graphs, and calculations
HR management skills	The use of approaches to ensure the careful and organized performance of work Development of new ways to do things better and more efficiently
Knowledge of the basics of corporate management	Knowledge of the principles and main strategies of the corporation Work experience in the specialty and position occupied by an employee Understanding corporate values
commitment to results	Ability to take responsibility for the work Ability to work in the deadline conditions, finish work on time Ability to check all types of work carefully according to high standards; ability to learn from mistakes Ability to identify and evaluate the relevance and importance of the tasks Demonstration of initiative and flexibility in job performance

The corporate competency model of a corporation provides a set of key competencies necessary for employees to successfully achieve the strategic goals of the whole corporation (Figure 1). Within the corporate model, requirements for employees are specified and key competencies are identified:

1. Corporate competencies: set corporate requirements for all employees of the corporation; determine the career potential of the employee in the corporation; describe personal attitudes and motivation.

2. Management ones: describe the management skills and competencies necessary for a successful leader of our corporation; determine the employee's willingness to perform management functions.

3. Functional ones: describe the specific skills and competencies required for the employee to successfully complete the functional responsibilities.

The main features of corporate staffing competencies include compliance with the requirements of a specific corporation, accounting for the specificity of a particular corporation, and the "internal versatility" - the level of development of the required competencies of all employees must meet the corporate staffing requirements.

Economic and mathematical model of formation of competencies of personnel in the corporation.

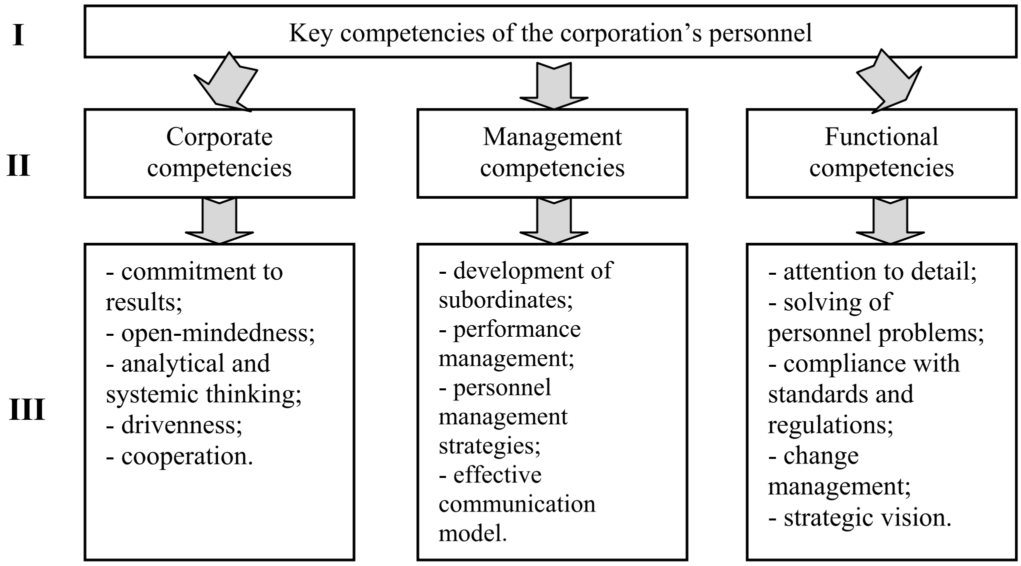

Figure 1. Level model of competencies of the personnel in the modern corporation

The authors created an economic-mathematical model that contains regression equations of the formation of basic competencies of personnel and their efficiency expression indicators. To build the model, the initial data set, which is presented in Table 2, was used.

Table 2
Initial indicators of construction of economic and mathematical model

Period	Labor productivity, EUR	Wages, EUR	Capital intensity of products, EUR	Labor turnover, %	Level of losses of working time, %	Average length of experience, years
	Y_1	Y_2	X_1	X_2	X_3	X_4
1						
2						
…..						
n						
n+1						

Model variables are identified: Y_1 is the labor productivity, endogenous variable; Y_2 is the wage, endogenous variable; X_1 is the capital intensity of products, exogenous variable; X_2 is the labor turnover, exogenous variable; X_3 is the level of lost working time, exogenous variable; X_4 is the average length of experience, exogenous variable. In general, the econometric model is:

$$Y_1 = f\left(Y_2,\ X_1,\ X_2,\ u_1\ \right);$$
$$Y_2 = f\left(Y_1,\ X_2,\ X_3,\ X_4,\ u_2\right). \tag{1}$$

It follows that labor productivity in the first equation is an endogenous (dependent) variable, and it is an exogenous (independent) variable in the second one. Wages are an endogenous (dependent) variable in the second equation and, at the same time, it is an exogenous (independent) variable in the first one. This interdependence of these two economic indicators is real, and an econometric model describes this dependence, not excluding other factors that also affect labor productivity and wages (Viitala, 2005). It can be seen in the equations that there is a dependence between the explanatory variables and the residuals of the model parameters. A model for the formation of competencies in a linear (structural) form is specified:

$$Y_1 = a_{12}\ Y_2 + b_{10} + b_{11}X_1 + \ b_{12}X_2 + \ b_{13}X_4 + \ u_1,$$
$$Y_2 = \ a_{21}\ Y_1 + \ b_{20} + b_{22}X_2 + \ b_{23}X_3 + \ b_{24}X_4 + \ u_2. \qquad (2)$$

Based on the sample data, the calculation model can be written as follows:

$$\hat{Y}_1 = \hat{a}_{12}Y_2 + \hat{b}_{10} + \hat{b}_{11}X_1 + \hat{b}_{12}X_2 + \hat{b}_{13}X_4$$
$$\hat{Y}_2 = \hat{a}_{21}Y_1 + \hat{b}_{20} + \hat{b}_{22}X_2 + \hat{b}_{23}X_3 + \hat{b}_{24}X_4 \qquad (3)$$

In summary form, the econometric model takes the form:

$$\hat{Y}_1 = \hat{r}_{10} + \hat{r}_{11}X_1 + \hat{r}_{12}X_2 + \hat{r}_{13}X_3 + \hat{r}_{14}X_4$$
$$\hat{Y}_2 = \hat{r}_{20} + \hat{r}_{21}X_1 + \hat{r}_{22}X_2 + \hat{r}_{23}X_3 + \hat{r}_{24}X_4 \qquad (4)$$

where $\hat{r}_{ij} / \hat{r}_{2j}\ j = \overline{0,4}$ is the estimation of the parameters of the summary form of the model.

As one can see, the constructed model includes regression equations characterizing the interdependence of all endogenous and all exogenous variables. The competency-based approach describes not so much human knowledge and skills as a model of professional behavior, with the help of which a direct relationship of applied knowledge and skills with specific, measurable results of the employee’s labor activity, consistent with the general development strategy of the corporation, is established.

Discussion

At the moment, in order to identify the abilities of personnel, to determine the prospects for their development and to increase the competitiveness and overall performance of the corporation as a whole, it is necessary to use the most modern methods. Thus, the development of a competency system is a significant step towards the restructuring of the entire personnel management system. A competency-based approach to personnel assessment provides the corporation with valuable information for making management decisions and helps to effectively organize all other HR processes. Knowing the strengths of our employees, their needs, and motivations helps us to purposefully develop people and advance them on the career ladder. In addition, in the future, it is necessary to formulate on the basis of the competency model all the basic HR processes: selection, assessment, remuneration, development, career progression, motivation, and more.

Conclusion

Studies have shown that the state of the corporation's personnel, the level of its qualifications and professionalism, the ability of hired employees to optimally solve the tasks assigned to them and make a profit directly depend on competencies and their practical implementation in economic activities. That is why it is necessary to synchronize the competencies of personnel and the competencies of the company, which should be focused on solving problems aimed at the development of strategic personnel management.

It is proved that competencies combine the abilities and motivation of an employee and describe its production behavior. So managerial competencies are realized in solving managerial problems (collecting and analyzing information, identifying problems, developing alternative solutions, and choosing the course of action), influence on others (transfer of necessary information, overcoming barriers and resistance, the ability to determine people's actions). Competencies are valuable not in themselves but only insofar as they help employees to achieve certain results in accordance with their strategic goals.

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WORLDWIDE TRENDS AND PERFORMANCE FEATURES OF ELECTRONIC COMERCE AND ELECTRONIC BUSINESS ACTIVITY

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Abstract. *The article analyzes modern changes and forms of electronic commerce and electronic business activity development in the global business environment. One has classified and gave a detailed description of practical aspects of the application of the forms of entrepreneurial collaboration in the field of electronic commerce as well as described the role of the Internet in the process of electronic business expansion. The article takes a look into the matter of worldwide trends that are currently observed in the e-commerce markets. One applied the foreign experience of institutional support for the development of electronic commerce and electronic business.*

Keywords: *electronic commerce (e-commerce), electronic business (e-business), Internet, institutional support, informational flows.*

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Introduction

The rush pace of scientific and technological development in all types of economic activity set in motion the appearance of new forms and methods of doing business and managing customer needs. Since the early XXI century, mankind experiences the influence of the worldwide information revolution like never before. It gradually changes the world’s style of life. The galloping development of electronic networks is undoubtedly one of the largest manifestations of the informatization of society. The Internet has become the key link in the goods and services exchange process, which is caused by the high handling capacity of the information flaws. At present, almost all business entities and international businesses focus their attention on the integration and development of the Internet-relations, which significantly increases the level of efficiency of business activity.

Literature review

While describing the notion of electronic commerce, the majority of foreign authors generalize it as an activity, covering all types of transactions between organizations and interested parties (Chaffey, 2009). The American researcher (Zwass, 1996) gives the following characteristics to e-commerce: business information exchange, the development of business relations, implementation of business transactions using telecommunications networks, and commercial relations. This means that he he emphasizes the business aspect of the notion. These researchers keep to the same idea (Devos et. al. 2014; Meier & Stormer, 2008) who determine electronic commerce as any form of business process, the interaction between the entities of which takes place via the means of electronic communication.

The business and trading aspects of e-commerce were also described by the researchers (Muhammad and Tanzila, 2012). They think that it includes the application of technologies in the financial business, online ticket reservation, provision, request, and use of the Internet for purchasing and selling goods and services, namely after-purchase services and support (Ramanathan, 2010). Thus, as you see, all those opinions regarding electronic commerce and the definition of the forms of its realization have something in common. However, the thoughts regarding this type of business activity change in proportion to the growth of the popularity of electronic commerce in entrepreneurial activity.

Methods

The modern information society forms the methodological fundamentals for holding research on the existence and improvement of the e-commerce business. Such fundamentals include the globalization pressure, the increased competition, the rapid change of technologies, the great commercial potential of e-commerce tools, the ability to move their business to a qualitatively new level, which brings adjustments to the traditional understanding of the principles of conducting business, and the spread of the use of various information technologies and software tools.

Results

The entrepreneurial interaction in the field of electronic business

The rapid development of information technologies in the late XX – early XXI centuries set in motion the beginning of cultural and economic globalization. The appearance of the global Internet network was the beginning of a period when computer technologies revolutionized almost all areas of human life. The entrepreneurs, who were the first to use the global network for e-commerce, received many competitive advantages, as well as quick access to information, and resources. The electronic commerce operates at three main levels:

The first level – Internet commerce – the simplest forms of interaction between the participants of the market, including traditional and public databases of information exchange.

The second level – electronic commerce – the transition from traditional trading practices to electronic ones, which is characterized by the liquidation of trading intermediaries who transform into managers, providing services and manage the processes of electronic commerce.

The third level – electronic business – the development and introduction of new forms of interaction between the entrepreneurs and new ways of information exchange, as well as methods of processing the received information and its interpretation (Martinez-Lypez, 2014). At present, electronic business entities can interact in various forms (Table 1).

At present, the Internet network quickly integrates into all industries of business activity, providing the implementation of business processes in the global electronic environment. The Internet becomes a business space, hosting electronic transactions via electronic tools. This promotes the acceleration of the capital turnover of business organizations and increases business profitability and the expansion of the web-representative office of the companies (Helms et. al. 2008).

Table 1
The forms of entrepreneurial interaction in the area of e-business

Form of entrepreneurial interaction		Features
Traditional forms	(B2C/C2B – Business-to-Consumer/Consumer-to-business)	The form of interaction between the entrepreneurs and consumers and vice versa. It provides extra possibilities for product and services delivery immediately to customers, while the consumers obtain wider choice opportunities. This form was one of the first strategies of e-business, including the direct flow of goods and services from manufacturers to final consumers, avoiding intermediate parties.
	(B2B – Business-to-Business)	The form of operational interaction of entrepreneurs at all levels, which focuses on the existing business, well-developed supply, marketing schemes, and well-established internal business processes. It provides an opportunity to combine internal networks of partners for joint electronic document management and creates a system for direct placement of orders with the possibility of detailing parameters, and tracking their implementation in the real-time mode, and is a new means of close communication. At present, this form is regarded as the most widespread one.
	(C2C – Consumer-to-Consumer)	The interaction between private individuals, related to purchase and sale, exchange or product delivery, service and information in the cyberspace. Among the examples of such form are: the advertising panels and Internet auctions.
Alternative forms	(B2B – Business-to-Business)	All levels of interaction using the electronic means between entrepreneurs who, in this way, can effectively build bilateral and multilateral economic relations, namely: sell products, place orders by themselves, and monitor their implementation using vendor databases, etc.
	(B2C – Business-to-Consumer)	Electronic retail commerce is oriented at the final consumer. The most prominent example of this type of e-commerce business is online retail trading, targeted at consumers.
	(B2A – Business-to-Administration)	The interaction between the entrepreneurs and administrative organs. It covers business, state, and international organizations. This segment of e-commerce is not well-developed but has perspectives for future development if the governments of the countries use their capabilities in a more actively for the support of entrepreneurs.
	(C2A – Consumer-to-Administration)	The interaction between consumers and the administration.

Electronic commerce at a global scale

The rapid growth of new markets is the key feature of electronic commerce on a global scale. The top ten most perspective West European markets rating also includes the British, German and French markets. The development of electronic commerce takes place at a rapid pace, which indicates the high efficiency of this form of business making. The volume of the top ten e-commerce markets based on the results of 2018 is given in Fig. 1.

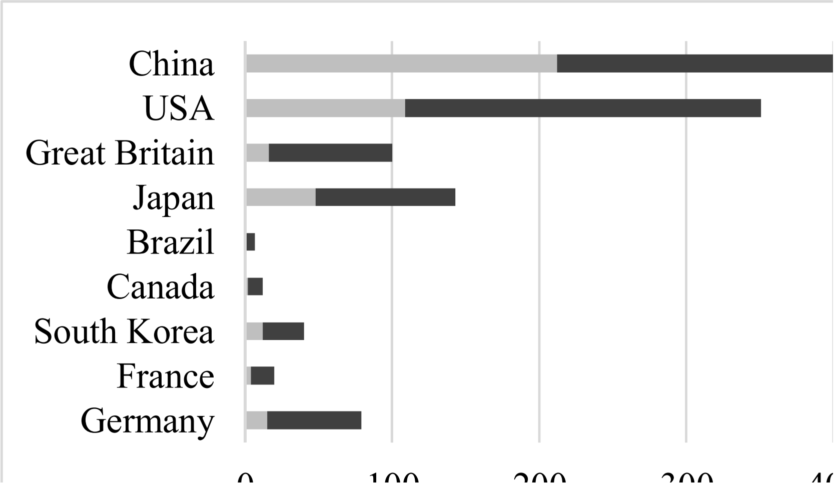

Figure 1. The volume of the largest e-commerce markets in the world in 2018 (E-Commerce Industry (2019)

The international ranking stays the same over the years. China is the e-commerce market leader with a turnover of $562.8 billion. The United States occupies the second place, boasting a turnover of $351.2 billion. China shows the highest rates of development. In 2018, its e-commerce turnover was $1.7 trillion (2.8 % of GDP of the country) (Fig. 2).

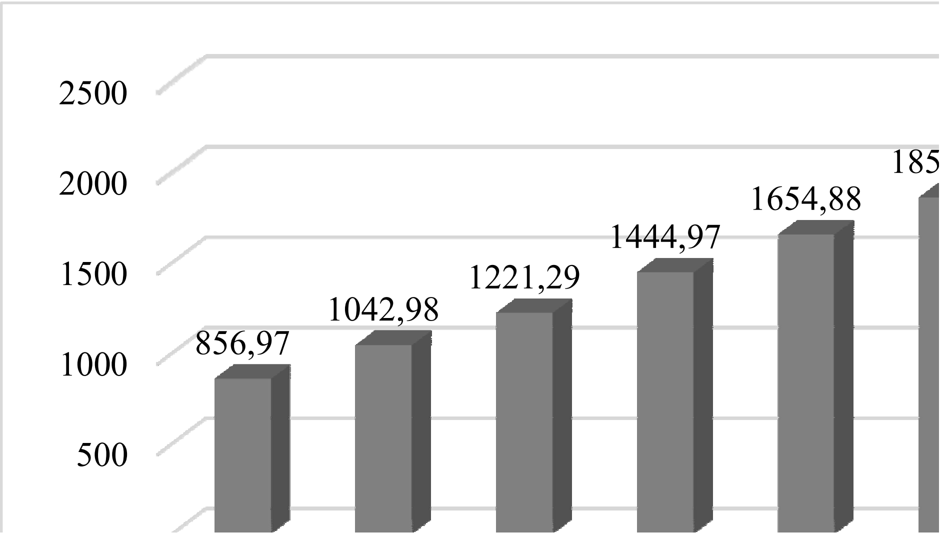

Figure 2. The level of global sales in the electronic sector B2C
(Worldwide retail Ecommerce sales e-marketer's updated estimates and forecast through 2019)

The implementation of the "online-to-offline" (O2O) service contributed to the increase in electronic sales from 2017 to 2018. The largest shopping centers foster cooperation with online platforms, which provides customers with the possibility to choose the goods offline and buy them at a reduced cost via the Internet. The market of online sales will rise fast thanks to the introduction of telecommunications technologies of the fourth generation, providing faster speed and accessibility (Nanehkaran, 2013).

E-commerce institutional support

In view of the e-commerce development dynamics, one has to mention that its market requires state regulations. The UNCITRAL Model Law on Electronic Commerce adopted following the resolution of the UN General Assembly on 30 January 1997 became the first step in the development of international law regarding electronic commerce regulations. His document has a framework, advisory nature and aimed at use by the countries as a basis for development of the national legislation. The Model Law laid down the legal foundations of activity in the field of electronic commerce, gave the definition of the key notions, such as electronic document, electronic document traffic, digital electronic signature, the author of an electronic document, and an information system; determined the legal and evidentiary power due to the documents in electronic form, and specified the requirements applied to the electronic signature as a means of confirming the authenticity and integrity of an electronic document (Fonseca, 2014).

For the development of the Model Law, the UN member countries worked out the international Convention project report on the electronic agreements. Its key task is to form the uniform and mandatory regulations on electronic agreements and their implementation. This Convention is aimed at shifting the relations in the field of international electronic commerce to a qualitatively new, higher level of development.

Table 2
The foreign experience of the institutional support for the development of electronic commerce and electronic business

Country	Regulatory instruments	Regularization of relationships in the field of electronic commerce
USA	The fundamentals of worldwide electronic commerce	– the transformation of the Internet into a setting managed by market mechanisms for communication and exchange of the products and services; – assistance in the development of electronic payment systems; – the establishment of the common standards of commercial regulations; – the intellectual property protection within the Network; – authentification and personification of information; – the unification of information systems in sectors, which belong to different industries, including the production sector; – the promotion of web-services development for support of e-commerce; – the encouragement of healthy competition and push for the cooperation of national telecommunication systems; – the adversarial relationship to non-tariff restricts in e-commerce.
Canada	The strategy of Canada	– the assurance of the customer's trust to "digital" economy: the questions related to the provision of e-agreements safety, cryptography, and protection of private data, and consumers interests have to be worked out in the framework of the partnership dialogue between the government and a private sector; – the regulation of specific issues related to e-commerce: the development of general flexible legal frameworks and trade regime, the adaptation of legislation in the area of tariffs and imposition of taxes, the provision of intellectual property protection for electronic products; – the improvement of information infrastructure: the creation of new high-speed communication highways, the provision of fare access and network connection and support of the competitive environment, the establishment of open standards, and assurance of compatibility of networking environment; – the popularization of e-commerce: the conduction of works related to "electronic literacy" of the population on the national level.
Singapore	The plan for the development of the e-commerce system	– the achievement of leading positions in the South-East Asia Region related to e-business; – the establishment of the correspondence between the elements of the e-business infrastructure in Singapore and the worldwide standards; – the maximum harmonization of basic legal and financial provisions with the worldwide requirements and norms; – the assurance of expansion of e-commerce, educational programs of high quality, and access to the Internet; – the establishment of e-commerce as a part of the business culture of Singapore society thanks to the updated system of education, wide use of its advantages by private entrepreneurs and the general public.

The European Union actively participates in the formation of international law in the field of electronic commerce along with regulatory support of the UN e-commerce sphere. In 1998, one adopted the Directive on certain legal aspects of electronic commerce in the internal market. Its target mission is to provide the conditions for the proper functioning of the international electronic commerce between the EU member states. When compared to the Model Law, this Directive is quite a large document in terms of size, which determines legal regulations of business activity in the Internet. Apart from general provisions, it includes the set of norms, regulating separate aspects of electronic commerce. The Directive of the European Parliament and the Council of 13 December 1999 on a Community framework for electronic signatures is another important document, which forms the European law in the field of e-commerce (Boughzala et. al., 2015). The national legislation of specific countries, regarding the Internet-related regulations, is also developing extensively (Table 2). Especially active legislation is observed in the USA and European countries.

Thus, we see that the entrepreneurial activity in the field of electronic commerce might have further steps to its improvement, which can be reflected using the following provisions:

– the improvement of competition – the access to the information of competitors increases the level of requirements of the potential customers, in light of this, the entrepreneurs are forced to change the ways of organization and business management, the barriers between the departments of the company disappear, and their relations become simpler;

– the globalization of fields of activities – the information exchange significantly changes the spatial and temporal scope of commerce;

– the personalization of interaction – it provides detailed information on the requests done by each customer and automatically offers products and services based on the individual requirements of people;

– the reduction of product distribution channels – the goods are delivered directly from the manufacturer to a customer, avoiding traditional channels in the form of wholesale and retail warehouses, which leads to a reduction in the product value;

– saving of expenses – each process, which might use the electronic interaction, has the potential to reduce the expenses of the entrepreneur.

Discussion

The gradual transition of the global telecommunication networks to digital standards resulted in the emergence of a common e-network infrastructure, which, in its turn, promoted the disappearance of differences between the phone network and the data communication networks, the utility systems and the corporal networks, which has significantly influenced the development of worldwide electronic business and is well-received by the international business environment. Among the key advantages for entrepreneurship are moneymaking and the creation of integrated chains of added value, the achievement of material effect on all international aspects of electronic commerce organization – from strategic planning and business processes up to the formation of efficient relationships with key target international online viewership (consumers, personnel, and partners) under current conditions of the worldwide information society development.

Conclusions

Thus, the authors have systemized and summarized the evolution of applied views related to the study of the genesis of the origin and formation of the worldwide electronic commerce concept. They also determined its main components and features. The powerful capabilities of the use of the Internet in the field of global e-business (e-commerce) caused the emergence of an increasing number of diversified commercial business structures of different types and, as a consequence, new acronyms of international significance, which denote them and used in international e-business. The foreign experience of the institutional support for the development of e-commerce and electronic business points at a high grade of integration of electronic tools of business into the general economic and social processes around the globe. The actuality of implementation of business initiatives using the tools of e-commerce is certainly an important aspect as such an approach optimizes the processes of management and control, providing at the same time an impressive economic effect.

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WOMEN'S ENTREPRENEURSHIP IN THE DEVELOPMENT OF THE NATIONAL ECONOMY

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Abstract. *The paper is devoted to the socio-economic issue of women's entrepreneurship in the national economy. The features and benefits of the state-level support for women's entrepreneurship have been identified, the main barriers and complexities of women's entrepreneurship development were determined. The defining ranks in the system of female entrepreneurial orientation were characterized. Development models the women's entrepreneurship in the national economy of the country have been developed.*

Keywords: *women's entrepreneurship, models of women's entrepreneurship development, European women, gender aspects, ranks in the business orientation system, countries of Central and Eastern Europe.*

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Introduction

In the context of the modern radical reformation of public relations in Central and Eastern Europe, the role of women in society is changing radically; its social functions are differently defined. A woman is actively involved in various types of livelihoods driven by the needs of a market economy, including the entrepreneurship system (Ambrish, 2014). The gender dimension of modern market economic relations is of particular importance given that women continue to be one of the decisive factors of social production on the whole. Another reason is the following: deployment of women's entrepreneurship creates opportunities to enhance the innovative potential of the modern European economy today.

Literature Review

Publications (Ahl, 2002; Allen and Truman, 1993) on the contemporary economic situation of women in business address such major issues as the current status and problems of women in the labor market in the context of economic transformations, women's unemployment, causes and consequences of gender segregation in the labor market, causes of gender differences in salary, relationship between reproductive and productive labor in women's lives. A number of papers (Gatewood et al., 2009; Jennifer & Candida, 2013) are dedicated to a particular phenomenon in the European economy - women's entrepreneurship. Thus, (Robertson, 2010) analyzes gender features of entrepreneurship, a team of researchers (Meyer and Mostert, 2016) identifies and characterizes ways of women's entry into business, and (Shane, 2003) identifies and characterizes major barriers to women's involvement in entrepreneurship. Therefore, the issue of women's entrepreneurship requires more detailed research.

Methods

The methodological bases of our study have economic, social and psychological aspects, they are related to the fact that women's entrepreneurship is a special type of the person's economic activity performed by women aimed mainly at self-realization of social qualities, self-affirmation in society, proof of their abilities, through the creation of new forms and improvement of the former types of production. It is conducted by the self-selected risk, despite the difference between men's starting positions and various prerequisites for business (education, capital, and power), as well as the need for specific female household functions.

Results

Conceptual foundations of becoming female entrepreneur

The conceptual basis of the authors' position on the essence of women's entrepreneurship is the understanding that this is a special type of economic activity performed by a women aimed at, unlike the men activities, mainly on the implementation of their social qualities, self-affirmation in society, proof of their abilities, through creation of new forms and improvement of former types of production. It is conducted by the self-selected risk, despite the difference (in comparison with men) of starting positions and various prerequisites in doing business (education, capital and power), as well as the need for a remained specific female household function.

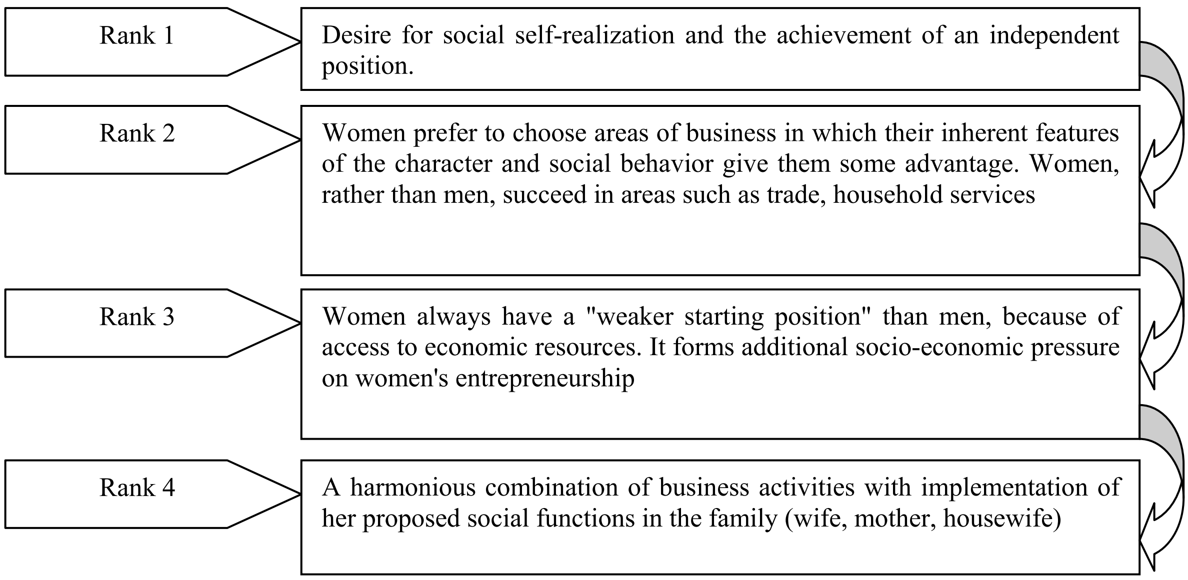

Figure 1. Determinative ranks in the system of female entrepreneurial orientation

Thus, in our opinion, women's entrepreneurship has a special structure of motivation for doing business, which is different from the men's motivation. This gender difference makes it possible to consider women's entrepreneurship as a particular type of entrepreneurial activity (Manolova et al., 2008). We define the hierarchy of ranks in the system of female entrepreneurial orientation (Fig. 1).

At the same time, gender stratification in business is a process of the status and the main trends in overcoming the differences between men and women, as well as perception of these differences in the society regarding: (1) doing business on the whole; (2) "specializations" in different types of entrepreneurship; (3) business management opportunities based on differences in education, accessibility to power, and availability of capital (McAdam, 2013).

A woman has mastered many spheres of business professional activity in the national economy, but the business with its dynamics is able in relatively short time to reveal ability or inability of the manager to lead the organization to success. It means that the woman's entry into the business will demonstrate business potential and inspire confidence, it will help to overcome outdated performances.

Today, a non-traditional management style fosters to the transition to a new management paradigm. Its essence is a shift away from managerial rationalism towards greater openness and flexibility. The so-called one-dimensional management styles are more typical for men: authoritarian, corporate, bureaucratic, and patriarchal. There are also multi-dimensional management styles, such as delegation of authority. Women in business are mostly archive success by the "intuitive" methods. The intuition allows to form creative lines of behavior in the business environment with many unknowns.

A woman's success in business may not be achieved by approaching a male management style, but by creative use of her possibilities, own stereotypes of behavior that has recently considered as unacceptable in leadership. The main factors and trends in the development of European women's business are: (1) the absolute and relative gap between women and men in terms of entrepreneurship; (2) increase in the share and volume of women's unemployment, spreading of its "chronic" forms among women as a factor of the women's business deployment; (3) dramatic reduction and displacement of women from the sphere of production management, less opportunities for privatization of state-owned enterprises; (4) distorted indicators of women's entrepreneurship in connection with the registration of women's businesses under actual male leadership; (5) educational and industry disparities leading to relevant gender issues in business; (6) higher level of family well-being in a businesswoman than in other groups of women; (7) women's focus on business for the purpose of expressing themselves and acquiring a position independent from men; (8) predominance of hiring managers among female entrepreneurs, their number is less between co-owners or owners of firms (Orhan and Scott, 2001).

The main obstacles to the women's entrepreneurship development in the countries of Central and Eastern Europe are: 1) not only economic and legal barriers are hindered to the mass women influx into business today, but also unrestrained prejudices, eternal willingness of women to be on the second roles. From the point of view of efficiency, the optimal demographic structure of private business envisages an equal (50/50) number of women and men; 2) as in the whole world, the problem of unequal conditions for equal access of men and women to public resources is a topical issue in the countries of Central and Eastern Europe; (3) it is especially difficult to organize employment for women in agriculture, including in the field of agricultural processing; (4) gender aspects are not sufficiently taken into account in the development of government programs at different levels; (5) poor awareness of women entrepreneurs about governmental business support programs, about women's business lending programs; (6) underdeveloped training infrastructure for women entrepreneurs; (7) bank relationships are started from a micro-credit at the first stage (Simonin, 2006; Walker and Webster, 2007).

Assessment of women's entrepreneurial activity at the international level

Global Entrepreneurship and Development Institute (GEDI) uses the Female Entrepreneurship Index (FEI) to assess women's entrepreneurial activity at the international level. Calculating the index envisages comparison of three indicators: status of the business environment, business ecosystem, direction of entrepreneurs. The leaders in the ranking are the USA, Australia, the United Kingdom, Denmark and the Netherlands. The indicator reflects the level of the business and social environment promotion for the development of women's entrepreneurship. Most women (96%) who took part in the FEI survey are positive about entrepreneurship, many women (75%) see themselves as entrepreneurs, but 11% of women are not ready to do business. Unlike men, the main motive to engage in entrepreneurial activity for women-entrepreneurs is the possibility of obtaining additional income (37%) and the need for self-realization (28%). Women have a strong creative start, intuition, desire to save and increase, they are less at risk and not so confident compared to men. At the same time, 53% of women are convinced that it's possible to learn entrepreneurship and compensate possible gaps in special knowledge (Global Entrepreneurship Index (2018) (Fig. 2).

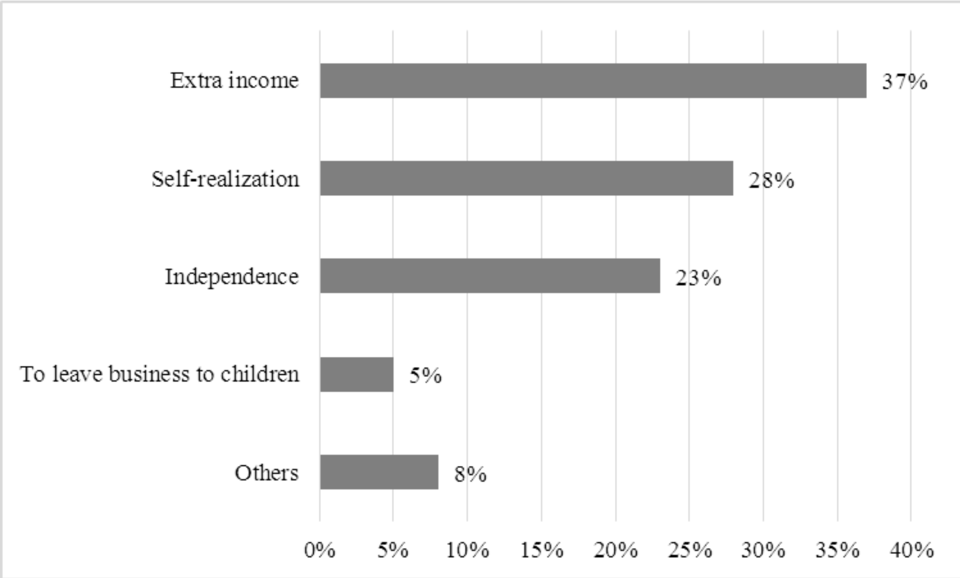

Figure 2. The main reasons for the transition of European women into entrepreneurship
(Women in business, 2018. Grant Thornton International Business Report)

It should be noted that women are actively involved in business in Europe, even if they aren't owners and are employed. Poland and Germany are leaders by the number of women-managers. 40% of senior management positions are held by women, 43% of companies are headed by women in Central Europe, while this indicator is significantly lower in the countries with developed market economy. Thus, this indicator is 8% in Japan, in Germany - 14% (Women in business, 2018. Grant Thornton International Business Report).

Models of women's entrepreneurship development at the national level

According to the basic theoretical assumptions in the women's entrepreneurship sector, we propose to identify two large models not antagonistic in nature but define very different sets of tools for its development (Table 1).

Table 1
Development models of the women's entrepreneurship in the national economy of the country

Model I	**Model II**
Characteristic:	
women entrepreneurs, which are satellites of the large and medium-sized business	women entrepreneurs, independent from the large and medium-sized business
connection and dependence on other business entities:	
it is determined by the status development of small and medium-sized business	it is not directly dependent on the development of large and medium-sized business
qualification needs:	
it makes high demands on qualification, competence and training	it does not require highly skilled workforce
growth restriction:	
it is a component of a "distributed" production system - it depends on the parameters agreed with the large business	it is an element of the independent network - it depends on the disclosure of the entrepreneurial potential of the nation
main social parameters:	
there is not any reaction to the public needs in the labor market	rapid absorption of labor surplus
update rate:	
low upgrade rates (low level of bankruptcy and exit from the market)	high upgrade rates (high level of bankruptcy and exit from the market)

Sustainability	
relatively high constancy	low constancy, high risk
external assistance needs:	
they are components of state support for industries / sectors	possibility of development with little need or lack of government support programs and budget funds
main partners' requirements:	
continuity and timeliness	new ideas, dynamism
equipment requirements:	
it often requires high-productive specialized equipment, critical requirements for space and transport infrastructure	average needs in universal equipment, non-critical requirements for space and transport infrastructure
availability of market niches for new entities	
low, depends on the needs of "parent" companies	high, determined by new ideas
key development indicators:	
share in GDP, sales volumes	number of jobs
"Bonus" development indicators:	
number of jobs	share in GDP
share of the value added:	
in a wide range	in a wide range
barriers to the market entry :	
relatively high	mostly low
policy tool:	
above all, it is a tool of economic policy	above all, it is a tool of social policy

The subjects of female entrepreneurship of model I are full-fledged economic entities differed in size only. It determines their orientation to highly specialized market niche, where the scale effect on which they lose does not matter much. All regulatory requirements may be applied to model I entities, as well as to medium or large businesses, as they are often linked by a single production programs. These women's business entities require highly skilled workforce and cannot dynamically link the excess of human resources resulting from all kinds of economic turmoil. They don't almost influence the market competition development; there is limited horizontal competition with potential attraction to monopoly in the sector (Robb and Coleman, 2009). The development of the Model I entities is a natural continuation of the evolution of 'parent' companies of large or medium-sized business, which reduce the need for low-skilled labor, relying on efficiency, productivity and introduction of new technologies.

Female entrepreneurship entities of the Model II are highly dynamic, with a short life duration and high market entry / exit rates. Due to the minimal own resources, they naturally concentrate in the traditional spheres of rapid capital movement (trade, services) and mostly do not use highly skilled workforce. Accordingly, they have a high potential to "bind" excess workforce. Positive influence is performed only in terms of their size. The high rates of renewal make their need for simple and understandable regulatory and tax requirements. Due to their high dynamism, large number and mostly low barriers to entry, they operate in a highly competitive environment, which, in case of lack of ownership, encourages them to search for new market niches and products.

These differences in Models I and II define a different set of social outcomes (with a focus on purely economic outcome or mainly social outcome) and, accordingly, require different instruments of state support. Model I government policy expects rapid GDP growth and the subsequent redistribution of national wealth through budgetary mechanisms, so it should provide first and foremost support of big business entities and introduce the same regulatory and tax rules, as well as separate programs to support a limited range of female entrepreneurs (Brush and Cooper, 2012). Model II government policy expects high public employment and economic autonomy, and therefore should focus on offsetting the risks of high changes rates in the female business environment by fundamentally simplifying regulatory and tax rules for business entities.

In the context of the economic crisis and the post-crisis recovery, model II becomes critical to the social climate in society. In the context of stable socio-economic development, model I comes first. It should be emphasized that the priority of model II does not include the development of model I subjects, but the priority of model I almost completely excludes the possibility of development of model II subjects.

Discussion

The recommendations are related to the further use of two fundamentally different models of women's entrepreneurship, characterize their socio-economic characteristics and determine the specificity of public policy tools aimed at developing national women's entrepreneurship. Taking into account the differences between these two models and defining at the level of the main social groups the key goal of the development of women's entrepreneurship can be the basis for developing an effective strategy for its development in the countries of Central and Eastern Europe. The results of this study explain the difference in the most commonly used approaches to the formation of national policy for small business development policies and can be the methodological basis for a new strategy of the development of national women's entrepreneurship in European countries.

Conclusion

Therefore, it can be argued that women are less able to implement their activity in the field of business due to the presence of institutional barriers and obstacles of different nature, which negatively affects the women's activities and career achievements, thereby reducing their self-esteem and desire for self-fulfillment. Although women-entrepreneurs in Central and Eastern Europe are a quarter of business owners, they own mostly small businesses. Women-led businesses are less profitable, regardless of industry, size of business, and their income. Especially important in today's realities is to promote the development of women's entrepreneurship, because entrepreneurship awakens women to take an initiative for business activity and economic activity, without expectations for the care of the state, which deprives them of the kept psychology and promotes the formation of the middle class.

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